

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

- Utility Patent Specification -

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Invention:

**EXTENDED INTERFACED, UNDER &
AROUND CHIN, HEAD SUPPORT
SYSTEM For RESTING While SITTING**

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(P/A File ID: WILLD01/98-1070; WPcode: PWILLD02.wpd)
[Printed: September 21, 2000]

Description

Extended Interfaced, Under & Around Chin, Head Support System for Resting while Sitting

5 **Technical Field**

10 The present invention relates to a portable, head support system for supporting
15 the user's head in an at least generally upright disposition, while the user, for
example, rests, including napping or sleeping while traveling sitting in a seat. The
present invention further relates to such a head support system which interfaces with
the underside of and up and around the front and sides of the chin and from side-to-
side of the chin in "face-to-face" surface engagement over a relatively large chin and
surrounding areas using a supportive block of solid molded foam material having an
oblong shape with its bottom resting centrally on the upper, central chest of the user,
with an adjustable, anchoring strap positioned, for example, around and about the
back of the user's neck. Additionally, the present invention is directed to reliable
anchoring or attachment subsystem holding the device to the user's body when the
user, for example, supports his/her own head with their neck muscles, and to
associated means therefor for preventing the head supporting device from being
pulled inadvertently into the throat, possibly interfering with breathing.

Background Art

The following table lists a number of patents at least some of which may be of general background interest to the present invention, but not all of which are from the art to which the invention pertains.

5	<u>Patent No.</u>	<u>Patentee(s)</u>	<u>Date</u>
	2,582,571	Thoma	1952/01/15
	3,645,259	Schulman	1972/02/29
	3,814,942	Darden	1974/06/04
	3,929,309	De Vore	1975/12/30
10	4,097,086	Hudson	1978/06/27
	4,183,583	Zuesse	1980/01/15
	4,565,408	Palley	1986/01/21
	4,707,031	Meistrell	1987/11/17
	4,753,478	Weinreich	1988/06/28
15	4,757,554	Blair	1988/07/19
	5,108,150	Stas <i>et al</i>	1992/04/28
	5,378,042	Daneshvar	1995/01/03
	5,471,690	McNeill	1995/12/05
	5,505,523	Wang	1996/04/09
20	5,758,375	Horowitz	1998/06/02
	5,868,471	Graham <i>et al</i>	1999/02/09
	6,007,156	Chang	1999/12/28

Also, note the American Automobile Association's magazine of 1998, p. 28, and its ad entitled "Don't let driving be a pain in the neck!" for a wedge shaped, foam
filler positioned against the car seat around the back of the neck and the sides of the
neck of the user for neck supportive use while driving. Additionally, a blow-up
cushion similar to the configuration of this device is also known and has been on the
market for a number of years.

The prior art has suggested a number of different approaches for the support of the human head, typically while the user is napping or sleeping, while sitting.

With respect to an under-the-chin approach broadly, the '259 patent to Schulman, which is not from the art to which the present invention pertains, is directed to an automatically inflatable, aviator's head positioning and restraining device which is inflated during an emergency to allow the user to best withstand the high "g" damaging effects of sudden acceleration and deceleration during an ejection from, or the crash of, an airplane. However, even in this non-prior art, emergency crash system, the head supporting element is not solid and therefore not always present when located on the user but only when an emergency arises and only supports the underside of the chin and provides no on-the-sides or even side-to-side or any front support.

The De Vore '309 patent, likewise not from the art to which the present invention pertains, is directed to a non-portable, head rest for use in a beauty parlor to hold the head in a set position to prevent the user from contacting the hot parts of a hair drying machine and uses two, curved, hinged, metallic side pieces which are relatively thin and therefore provide hard, substantially unyielding, support over a very limited part of the underside of the bottom of the head spaced away from the chin.

The Palley '408 patent is directed to a portable head support for sleeping or resting in a sitting position (the art to which the invention pertains) which uses a flexible band (14) extending from side-to-side underneath the chin supported by two, thin, rigid, side supports ("plaques" 11 & 12) resting on the user's collar bone (note
5 Figures 5 & 6) on either side of the head supporting the band like a "hanging bridge," which applies all of the weight of the head on two, very limited, thin strip areas of the user's body, namely, only on the shoulder-collar bones with a thin, orthogonal interface.

This relatively high intensity, concentrated application of the forces from the
10 head's weight is relatively uncomfortable. This is in contrast to the wide area application, solid block material approach of the present invention, which extends solidly with a soft interface, foam material directly down to the user's central, upper chest over a relatively wide area distributing the head weight forces over that relatively wide area, particularly the area overlying the strong, laterally extended,
15 manubrium sterni bone area. Additionally, there is no side support or front support of the over-all chin area, in contrast to the cup-like, full support provided in the present invention.

Likewise there is no reliable anchoring or attachment subsystem for holding the device to the user's body when the user, for example, supports his/her own head
20 with his/her respective neck muscles and then raises the head and moves the head

from side-to-side, or any associated means therefor for preventing the device from being pulled into the throat, possibly interfering with breathing, as in another aspect which is achieved in the preferred embodiment of the present invention.

It is further noted that apparently there has been no commercial success to the
5 Palley invention and hence no established practicality or utilitarian appeal to his approach, as his patent now stands effectively abandoned due to the non-payment of its second maintenance fee. Thus, one of ordinary skill would likely not look to the Palley disclosure for any meaningful guidance.

General Summary Discussion of Invention

Thus, in contrast to the relevant prior art, the present invention in its preferred embodiment is directed to a head support system for supporting the user's head in an at least generally upright disposition, while the user, for example, naps or sleeps or otherwise rests, while traveling sitting in a seat, for example, in a bus, plane, motor
5 vehicle or the like, with the head support element interfacing with the underside of and, preferably, up and around the front and sides of the chin and from side-to-side of the chin and underneath the rest of the exposed bottom of the head back toward the top of the neck area in "face-to-face" engagement over a relatively large area with a
10 soft but self-supporting, solid, foam, supportive material having an oblong, block shape with its extended bottom resting centrally on the upper, central chest area in "face-to-face" surface, extended engagement with the user's manubrium sterni area, and with an anchoring strap positioned, for example, around and about the back of the user's neck with means to prevent the device from being drawn into and against
15 the neck, possibly interfering with breathing. Such an approach provides a very comfortable, reliable, full support of the user's head with a device which is very light in weight, small in size, and easily transportable.

The preferred embodiment further assists in the full interfacing by providing a combined "U" & "V" shaped, upper end portion with a centrally located, curved
20 depression area which substantially matches the general contour of an average

person's chin and surrounding facial area and the underneath area approaching the neck, namely, in front of and around and along the mental protuberance with its central cleft, preferably below the mentis, essentially forming a cup for the chin, and a generally bulbous or laterally extended, bottom portion with a bottom surface which preferably is flat and preferably has some flex or give for comfort for comfortable support on the user's strong manubrium sterni area.

Additionally, the present invention is directed to reliable anchoring or attachment subsystem always holding the device when positioned for use to the user's body, even when the user, for example, supports his/her own head with his/her neck muscles and moves the head from side-to-side, and to associated means therefor for preventing the head supporting device from being pulled inadvertently into and compressively against the throat, possibly interfering with breathing.

The preferred, supplemental anchoring or attachment of the support element to the user's body is a soft material strap extending back around the neck with a string or other form of line having terminal ends which are attached at the front by preferably a push-button/barrel latch operating on the end portions of the line. The line is easily cinched up while the button is depressed and locked by releasing the button in, for example, the line's cinched up disposition, and thereafter unlocked with again the simple press of the button and a pulling in of the line ends toward the back

and/or the pulling out of the then unlocked lock with respect to the line ends while the user, for example, grasps and holds the device's central shank with the other hand.

As will be seen in connection with the preferred embodiment, the head supporting device or element, with its lateral and longitudinal extensions at the upper
5 and lower ends of the device in combination, with their respective contacts with -

- the chin area, namely, from the front and along and over the sides of the mental protuberance and its central cleft (preferably below the mentis), namely the symphysis of the mandible, back along the mandible body toward the neck, and

10 the chest area of the user, particularly in and over and across the manubrium sterni area,

prevent the device from being pulled in against the throat area, including preferably the thyroid cartilage, the arytenoid cartilage, the cricoid cartilage and the tracheal cartilages, and adjacent areas, when the line ends are cinched up past the preferred
15 push-button/barrel lock in attaching the device to the user for use as a head support.

Additionally, with the bottom of the device being upwardly angled at its rear at, for example, forty-five (45°) degrees, causes the device to rise, rather than uncomfortably "dig in," as it is moved back, strengthening the engagement of the device with the user's chin area, further preventing or at least discouraging the device from being
20 moved back against the user's throat.

Also, it is desirable that the latching string line be made of a material that preferably is designed to be limited in its strength, that is, designed to break when the forces on it become too great, as, for example, might occur when the strap or line gets entangled on something as the user's falls while wearing the device. Supplemental, replacement lines could be included with the device as a commercial product for the user to be able to immediately put the device back to use in the case of such an unlikely event actually happening.

It is thus a basic object of the present invention to provide a light weight, portable support for a user's head while the user is seated for resting, for example, napping or sleeping or relaxing and the like during, for example, travel, which is very comfortable and reliable, preferably supporting the user's head all about the chin area and underneath

the user's head weight over a wide, central, upper chest area, particularly over and across the manubrian stérni area.

It is still a further object to improve the interfacing of the oblong block of supporting material by including at its upper end a combined "U" & "V" shaped, downwardly angled, depression area for enhanced interfacing of the upper surface of the block material with the chin and surrounding facial and side and front areas.

It is also an object to additionally provide a reliable anchoring or attachment subsystem holding the device to the user's body even when the user, for example, supports his/her own head with his/her neck muscles, and to associated means therefor for preventing the head supporting device from being pulled inadvertently into the throat, possibly interfering with breathing.

It likewise is still a further object of the invention to provide an easily actuated and de-actuated attachment subsystem attaching and securing the support element to the user's body, preferably around the neck, using a strap/string/button-barrel subsystem.

It is also a supplemental object to provide such a head support system which can be easily grasped and held in the hand of the user for ease in moving and positioning the head support element preparatory to use and positioning and at the time of removal.

It is likewise an object to provide such a head support system which is safe in use.

PatApp.: "...Under & Around-Chin, Head Support System..."

Brief Description of Drawings

For a further understanding of the nature and objects of the present invention, reference should be had to the following detailed description, taken in conjunction with the accompanying drawings, wherein:

5 **Figure 1** is a side view of the preferred, exemplary embodiment of the head support system of the present invention in use, showing the user in phantom line.

Figure 2 is a front view of the preferred, exemplary embodiment of the head support system of the present invention in use, again showing the user in phantom line.

10 **Figure 3** is a close-up side view of the preferred, exemplary embodiment of the head support system of the present invention in use, likewise showing the user in phantom line, in which the physiology of the contact areas around the chin and the chest and non-contact areas at the throat can be readily seen and/or understood.

15 **Figure 4** is plan, rear view of the preferred embodiment of the head support system of the present invention by itself, showing its flat bottom and its top with its curved, combined "U" & "V".shaped, interfacing depression and the loop formed by the strap/string/latch attachment subsystem.

Figure 5 is front view of the preferred embodiment of the head support system of the present invention by itself

Figure 6 is a side, cross-sectional view of the head support system of **Figures 4 & 5**, taken along section lines **6-6** of **Figure 5**.

Figure 7 is a top view of the head support system of **Figures 4 & 5**, taken along perspective lines **7-7** of **Figure 5**.

Exemplary Modes for Carrying Out the Invention

- Listing of Reference Numbers -

For ease of reference to the drawings, the drawing reference numbers are listed below.

5	1		head support element
		10	central shank portion of head support element
		20	top portion of head support element
		21	left side edge of "V" shape
		22	right side edge of "V" shape
10		23	curved interfacing depression
		30	bottom portion of head support element
		31	flat bottom surface
		40	user attachment sub-system
		41	strap of webbing material
15		42	"shoe-string" like line
		42a	one end of string line
		42b	other end of string line
		43	latch
		43a	barrel of latch
20		43b	push button of latch
		44	line/support-element attachment points
		45	openings through strap section

As can be seen in the figures, the preferred embodiment of the head support system of the present invention includes a head support element 1 which has a central, reduced-cross-section, shank portion 10 flaring up and out to a top, support, chin-plus engaging portion 20 and flaring down and out to a bottom, central chest contacting foundation portion 30. These three portions 10/20/30 in combination form a solid, oblong block of self-supporting but soft surface, supporting material, with the material having sufficient structural strength to support the weight of at least an adult

human head and its own weight without collapsing. It is noted that the term "solid" when used herein includes material with air holes internally within them as, for example, occurs in molded foam material.

5 The central portion **10** is rounded and longitudinally extended, having curved, side surfaces of a size and contour which is easily grippable in one hand by the user for moving it about and placing it in position for use. In general, preferably all of the side and end surfaces of the head support element **1** are curved and smooth, as illustrated.

10 The top portion **20** forms an angled, curved, combined "U" & "V" shape with left and right, side, lobe portions **21** & **22**, respectively. Centrally between the side edges **21/22** at the very top of the top portion **20** is an angled, curved depression area **23** of a general contour to interface well with the average contour of the typical user's chin and surrounding areas, so that the top portion **20** interfaces with the user's chin and surrounding, side facial and underneath areas in "face-to-face" soft surface engagement (note particularly **Figures 4, 6 & 7** in connection with **Figures 1-3**). The curved depression area **23** is angled downwardly toward the user, when viewed from either side (note **Figure 1**), and angled downwardly from both of the sides to the center, when viewed from the front (note **Figure 2**), in essence forming an encompassing cup for the user's chin areas in the depression, with substantial side-to-side support, as well as underneath and frontal chin support and/or contact.

The bottom portion **30** preferably is curved and bulbous or laterally expanded or extended in shape with a flat, angled bottom **31** (note **Figure 4**), angled upwardly toward the bottom of the user's neck. The flat, bottom surface **31** preferably has some resilient flex or give to it, enhancing its comfort and flexibility.

5 As can be seen in **Figure 2**, when viewed from the front, the head support element **1** forms a general "Y" shape with a laterally extended base. This design produces a very stable, reliable, comfortable support for the user's head, particularly when the user's neck muscles are relaxed.

10 With reference to **Figures 1 & 2**, the head support element **1** supports the user's head in an at least generally upright disposition, while the user, for example, rests, including napping or sleeping, while traveling sitting in a seat, for example, in a bus, plane, motor vehicle or the like, with the top portion **20** of the head support element **1** interfacing with the underside of and, preferably, up and around the front and sides of the chin and from side-to-side of the chin and underneath the rest of the
15 exposed bottom of the head, back to the point or area approaching the top of the neck (note **Figures 1 & 3**), in "face-to-face" engagement over a relatively large area with a soft foam, solid, supportive material with its bottom surface **31** resting centrally on the user's upper, central chest area. Such an approach provides very comfortable, reliable support of the user's head with a device which is very light and easily
20 transportable.

The support element **1** preferably is attached to the user with an attachment subsystem **40** including an anchoring strap **41** positioned, for example, around and about the back of the user's neck (note **Figures 1 & 3**). The webbed strap material **41** preferably includes an interleaved, attachment, shoe-string-like line **42** having ends **42a** & **42b** connected together and fixed in their relative positions by a push-button latch or lock **43**, comparable to those used on jackets and the like. Such string latches **43** are generally in their locked disposition, and, when it is desired to adjust the ends **42a** & **42b** of the string **42**, the button **43b** is pushed or depressed down into the barrel **43a**, allowing the string ends to be readily moved through the latch.

The around-the-neck strap **41** and the line **42** together form a longitudinally extended, flexible member capable of forming an around-the-neck loop of varying diameter with sufficient strength to hold the device **1** to the user's head in normal operation. The strap **41** can be of webbing material as illustrated, or, more preferably, a soft, for example, foam material or any other material that can perform its function as well as be comfortable on the user's neck.

When it is desired to put the head support element **1** to use, starting as in **Figure 4**, the circumference of the string **41** forming the loop shown in the figure is adjusted to as large a size as needed to loop the loop around the user's head by depressing the push button **43b** and pulling back on the loop while the button is depressed. The properly sized loop is then placed by the user over the user's head.

The string ends **42a** & **42b** are then pulled out away from the user, drawing the support element **1** toward the user's neck and chin, while the button **43b** is depressed, until the support element **1** is drawn into comfortable engagement with the user's chin and surrounding areas and the upper, central chest area. The button **43b** is then let go and the support element **1** is then locked into place on the user.

It is desirable that the latching string line **42** preferably be made of a material that is designed to be limited in its strength, that is, designed to break when the forces on it become too great, as, for example, might occur when the strap or line **42** gets entangled on something as, for example, the user's falls while wearing the device. This likewise effectively provide a safety release. Supplemental, replacement lines could be included with the device when issued as a commercial product for the user to be able to immediately put the device back to use in the case of such an unlikely event actually happening.

As can best be seen in **Figures 1 & 3**, in combination the lateral and longitudinal extensions at the upper (**20**) and lower (**30**) ends of the device **1**, with their respective contacts with –

- the chin area, namely, from the front of and back along and up over the sides of the mental protuberance and its central cleft, *i.e.*, the symphysis of the mandible, back along the body of the mandible, toward the neck, and

- the chest area of the user, particularly over the manubrium sterni area,

prevent the device **1** from being pulled in against the throat area, including preferably the thyroid cartilage, the arytenoid cartilage, the cricoid cartilage and the tracheal cartilages and adjacent areas, when the line ends **42a** & **42b** are cinched up and the around-the-back-of the neck loop (see **Figures 2 & 4**) is lessened or pulled in.

5 Thus, it should be understood that the upper portion **20** of the device **1** extends up over the front of and around the sides and bottom of the user's chin, contacting its front, sides and bottom and its tip, namely, over, across and around the mental protuberance and its central cleft (below the mentis), extending all the way back along the underside of the mandible body toward the hinge of the mandible, 10 approaching, for example, the top of the neck, namely, the arytenoid cartilage, in essence cupping the chin and a portion of the mandible body area within it. The angled, bottom portion **30** rests solidly but flexibly on the upper, central portion of the chest, extending laterally over the manubrium sterni area, and up to or approaching the bottom tracheal cartilages of the downwardly extended throat area. 15 This interaction prevents the throat area from being compressively contacted, which could cause interference with the user's breathing.

 Additionally, the bottom **30** of the device **1** preferably is upwardly angled at its rear at, for example, a forty-five (45°) degree angle with respect to the "vertical" center-line of the device, that is, the device's "vertical," longitudinally extended axis.

20 This angled design causes the device **1** to rise, rather than uncomfortably "dig in" to

the user's chest, as it is moved back, strengthening the engagement of the device with the user's chin area, further preventing or at least discouraging the device from being moved back against the user's throat.

After properly positioning the device **1** and attaching it around the neck, the user then can rest, including napping or sleeping, at will, without worry that, when the neck muscles are relaxed, his/her head will fall forward or to the side, disrupting the user from his/her rest. Instead the head will be well, safely and reliably and fully supported over a broad, central area of the chest and chin with great comfort and ease and no discomfort to the user's throat or chest , including, for example, any discomfort to the user's shoulder collar bones as in the Palley '408 patent.

When the user desires to remove the head support element or device **1**, the user again merely depresses the push button **43b**, freeing up the loop formed by the majority of the string **42**, and pulls the head support element forwardly away from his/her chin and chest areas. The webbed strap **41** is then pulled up over the head, and the support element **1** stowed away until it is again needed for use.

As previously noted, the interfacing of the oblong block **1** of supporting material is enhanced by including at its upper end a combined "U" & "V" shaped, curved, front-to-back and each side -to-center downwardly angled depression **23** for improved interfacing of the upper surface of the block material of the support element **1** with the user's chin and surrounding facial and side areas.

As noted, an easily actuated and de-actuated attachment subsystem **40** attaches the support element **1** to the user's body, preferably around the neck, using a combined strap/string/button-barrel structure **41/42/43**. The adjustment string **42** is interleaved (note **Figures 1 & 4**) or otherwise attached to the back strap **41** and is moveable attached to the front of the support element **1** through front-side rings **44** (note **Figures 1-3**). As should be understood, the string line **42** is also free to move through the ring openings **45** in the strap material **41**.

Thus, thereby, the preferred embodiment of the present invention provides a light weight, portable support for a user's head while the user is seated to allow the user to rest, nap, sleep or the like during, for example, travel, which is very comfortable and reliable, supporting the user's head preferably all about the chin area and underneath the rest of the exposed underside of the head in "face-to-face," side-to-side, wide area interfacing, while causing the user's head weight to be distributed over a relatively wide area over the central upper chest of the user. It does this preferably with a solid block of supporting foam material which provides soft engagement with the user's body while serving to give wide support to the underside of the head and chin while also applying the user's head weight over an extended, upper, central chest area of the user, particularly over and across the manubrium sterni.

A suitable material used in making a prototype device for the solid block material of the head support element 1 was a modeling compound marketed under the famous Crayola's "Magic Model"™ mark which has the consistency and feel of the famous "Play-Doh"™ material during the shaping phase and then dries in about
5 twenty-four (24) hours into a fixed, solid but reasonably soft block. Many other materials could be used, but currently preferred is some foamed, molded material, such as, for example, polyurethane. It is likely that, in a commercial device, a different material will be used in place of the prototype's modeling compound material, possibly, for example, as noted, polyurethane of an appropriate density and
10 preferably having a soft, "cooling" skin surface as is readily and well known in the foaming/molding arts.

Exemplary, approximate or "about" dimensions for a "medium" size prototype, which are subject to great variation, are outlined below:

approximate overall height	five (5") inches
approx. overall side width at top	five (5") inches
approx. side width at center	two and a half (2.5") inches
approx. side width at bottom	three and a half (3.5") inches
approx. depth at top	two and a half (2.5") inches
approx. depth at center	one and a half (1.5") inches
approx. depth at bottom	two (2") inches
approx. angle of bottom surface (with respect to "vertical" center-line of device)	forty-five (45°) degrees

It is contemplated that in a commercial embodiment of the invention, the device **1** possibly will be provided in several sizes, for example, namely, "small," "medium" and "large" sizes.

Many changes and variations are possible in the embodiments of the present invention. For example, rather than securing the support element **1** directly to the user, it could be secured in place on the user by attaching the support element to the seat in which the user is sitting or some other securement point, although the securement or attachment subsystem described is currently preferred. As a further alternative, the securement could be made to some other part of the user's anatomy, for example, the user's head or ears or hat or the like or even with an upwardly extended, supplemental support attached to the user's belt, although a neck loop is currently preferred.

With respect to the configuration of the head support element **1**, there are many possibilities, including, for example, in particular but not exclusively the central shank portion **10**, as well as the design and contour of the chin cup formed by the upper portion **20**.

It should be understood that the foregoing variations and alternatives, *etc.*, are merely exemplary and many other changes to the preferred, exemplary embodiment are possible within the teachings of the present invention.

It is noted that the embodiments of the present invention described herein in detail for exemplary purposes are of course subject to many different variations in structure, design, application, materials and methodology. Because many varying and different embodiments may be made within the scope of the inventive concept(s) herein taught, and because many modifications may be made in the embodiments herein detailed in accordance with the descriptive requirements of the law, it is to be understood that the details herein generally are to be interpreted as illustrative and not in a limiting sense.